Problem 1

For the given function, find it’s derivative by using the POWER RULE (application of other rules is NOT permitted).

\[ b(x) = \frac{10}{x^5} \quad \text{hint: } \frac{10}{x^5} = 10x^{-5} \]

\[ f(x) = 2x^{10} + \pi x \sqrt{x} + \frac{10}{x^3} + 3x + 7 \]

\[ g(x) = \frac{x^5 + x \sqrt{2}}{x} \quad \text{Hint: simplify first} \]

\[ h(x) = \frac{x^m x^n + 100x^{k+1}}{x^k} \quad \text{for constants } m,n,k \]

Problem 2

Removable Discontinuity: Sometimes we can force a discontinuous function to be continuous by adding a single point. When we can do this, we call the discontinuity a **removable discontinuity**. A great example of this is the function \( f(x) = \frac{\sin(x)}{x} \), who is perfectly continuous on his domain (which is all the reals except 0). From \( f(x) \) we can construct a new function, \( F(x) \), by defining a value for \( F(x) \) at \( x = 0 \) and then making \( F(x) = f(x) \) for all \( x \neq 0 \). What value should \( F(0) \) be if we desire \( F(x) \) to be continuous at \( x = 0 \)?